

There was entirely too much rain for current needs over considerable areas in Kansas, Oklahoma, and northern Texas, and great damage to crops and other interests resulted, particularly in Oklahoma. In portions of the Middle and East Gulf States there was likewise a marked excess in precipitation, which, following the heavy rains of the preceding month, caused material loss or damage to crops.

On the other hand, there was a marked deficiency in precipitation along the immediate Atlantic coast from Florida to Pennsylvania. In portions of this area, particularly in eastern Pennsylvania, the month had the least precipitation for June in 50 years.

In general, precipitation was materially above normal over portions of the middle Gulf States; in the Great Plains, and eastern slopes of the Rocky Mountains, where at points in northern Texas the precipitation was the greatest ever reported in June; and in the Northern Plateau, where, in some localities, notably in northern Nevada, the total fall for the month was likewise the greatest for June of record. In the western Canadian Provinces, particularly those immediately to northward of Montana, the precipitation for the month was unusually heavy, some stations reporting nearly 5 inches in excess of the normal. In the west Gulf States there was a marked deficiency, and in the Great Lakes region and upper Mississippi Valley a moderate deficiency existed.

As is usual in summer, the precipitation was mostly the result of thunderstorms, and on account of their frequent local nature the monthly precipitation varied greatly within narrow limits. Some of these variations

by States are extraordinarily large, notably in Alabama the monthly precipitation ranged from 14.07 to 1.23 inches; Texas, from 11.81 to 0.00; New Mexico, from 12.31 to 0.00; and North Dakota, from 10.27 to 0.91.

SNOWFALL.

In the high mountains of California snow fell on the 15th and 16th; Tamarack, elevation 8,000 feet, reporting 9 inches, and Lake Tahoe, elevation 6,230 feet, 4 inches; and more or less snow was reported also from the high ranges of Nevada, Utah, Oregon, and in the main ranges of the Rockies.

On account of moderately cool and frequently cloudy weather, snow melting was not so rapid as usual; there was, however, plenty of water for irrigation purposes in California as well as in other districts where a supply of water from melting snow is expected so late in the season.

RELATIVE HUMIDITY.

Atmospheric moisture as expressed by the relative humidity was above normal over the greater part of the country, the excesses being most pronounced in the middle Plains, lower Missouri Valley, and locally in the Central Gulf States and the far West.

Along the Atlantic coast from Georgia to New England and generally over the upper Ohio drainage area and the Great Lakes region the relative humidity was well below the normal, and portions of the Rocky Mountain and Plateau States likewise has less than normal.

SEVERE LOCAL STORMS, JUNE, 1923.

[The table herewith contains such data as have been received concerning several local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau.]

Place.	Date.	Time.	Width of path (yards).	Loss of life.	Value of property destroyed.	Character of storm.	Remarks.	Authority.
Cheyenne, Wyo.....	2	P. m.....	3 to 14.....	.....	\$200	2 tornadoes.....	Barn and many fences damaged.....	Official, U. S. Weather Bureau.
Carlisle, Pa.....	3	.....	.....	.....	.....	Thunderstorm.....	Trees and poles blown down. Some injury to crops by hail.	Do.
Fort Wayne, Ind.....	5	P. m.....	.....	1	.....	Electrical and wind.....	Between 600 and 800 telephones out of commission. Power plants damaged.	Do.
Hartford, Conn.....	6	do.....	.....	.....	.....	Thunderstorm.....	Telephone service crippled; light and power lines damaged and a number of buildings struck by lightning. Tobacco crop injured by hail.	Do.
Eastern Washington.....	6	do.....	.....	.....	.....	Electrical and rain.....	Poles blown down, lighting service cut off; telephone service crippled.	Spokesman Review (Spokane, Wash.).
New York, N. Y., and vicinity.	6	4 p. m.....	.....	1	.....	Wind.....	Trees uprooted and buildings damaged. Many cellars flooded.	Times (New York).
Hoxie and Walnut Ridge, Ark.	6	.....	.....	.....	1,500	do.....	Considerable property damage.....	Official, U. S. Weather Bureau.
Roswell, N. Mex.....	8	P. m.....	.....	.....	10,000	Tornado.....	Several houses, barns, and outbuildings destroyed.	Do.
Macon, Ga.....	10	do.....	.....	.....	.....	Wind and rain.....	Damage to merchandise, dwellings and streets estimated at thousands of dollars.	Do.
South central Kansas.....	14	do.....	.....	1	.....	do.....	Town of Peck devastated, other villages damaged. Several persons injured.	Wichita Eagle (Kans.).
San Juan Basin, Colo.....	16-17	.....	.....	.....	.....	Wind and sand.....	Houses and barns unroofed; trees uprooted and highways blocked.	Post (Denver, Colo.).
Fond Du Lac, Wis.....	18	.....	.....	.....	8,000	Wind and electrical.....	Many tents destroyed and buildings at fair grounds damaged.	Wisconsin State Journal (Madison, Wis.).
Tallula, Ill.....	18	P. m.....	.....	.....	50,000	Wind and hail.....	Heavy damage to buildings and crops.....	Official, U. S. Weather Bureau.
Pittsburgh, Pa.....	19	2 p. m.....	.....	.....	.....	Thunderstorm.....	Oil tank struck by lightning, causing disastrous fire; 14 men injured and 11 families driven from homes.	Do.
Moorhead, Minn.....	22	.....	.....	.....	10,000	Wind and rain.....	Trees, telephone poles, and shop windows damaged.	Do.
Clarksville, Tenn.....	22	.....	.....	.....	.....	Thunderstorm.....	General damage estimated at several thousand dollars.	Do.
Lovell, Wyo.....	22	.....	1,760	.....	5,000	Tornado.....	Details of damage not reported. Path 7 miles long.	Do.
Clymer, Pa.....	23	.....	.....	.....	.....	Wind.....	Six houses damaged.....	Do.
Washington and Frederick Counties, Maryland.	23	.....	.....	.....	.....	Thunderstorms.....	A number of dwellings and barns damaged and trees uprooted.	Do.
New York State (greater portion of).	24	.....	.....	.....	255,000	do.....	Heavy damage, principally to crops.....	Do.
Adams County, N. Dak.....	24	.....	.....	7	.....	Tornado.....	Trees and buildings damaged and wires tangled.	Daily News (St. Paul, Minn.).
Springfield, Mass. (vicinity of).	24	.....	.....	.....	.....	Electrical and hail.....	Considerable minor damage.....	Official, U. S. Weather Bureau.
Rochester, N. Y.....	25	P. m.....	.....	.....	.....	Wind.....	Considerable damage to trees and wires.....	Do.
Niagara County, N. Y.....	25	.....	.....	.....	.....	Thunderstorms.....	Orchards injured and forest trees blown down.....	Do.
Southern Wisconsin.....	25	P. m.....	1	300,000	do.....	Heavy property damage.....	Do.

Severe local storms, June, 1923—Continued.

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Place.	Date.	Time.	Width of path (yards).	Loss of life.	Value of property destroyed.	Character of storm.	Remarks.	Authority.
Camden, S. C.	25				3,000	Electrical	Barn destroyed and valuable horse killed.....	Official, U. S. Weather Bureau.
Greenwood, S. C. (near).....	25				2,500	do	Two barns and contents destroyed	Do.
Tobacco section of Connecticut.....	26				100,000	Electrical and hail.....	Tobacco and tobacco barns heavily damaged.....	Do.
Oakland, Md. (2½ miles south of).....	26					Wind	A house and barn blown down, and several children injured.....	Do.
New York City and vicinity..	26			3		Wind and electrical.....	Some property damage and several persons injured.....	Tribune (N. Y.).
Southwestern and central Iowa.....	27			1		Wind and rain.....	Considerable property damage and crops severely injured.....	Official, U. S. Weather Bureau.
Evansville, Ind.	27					do	Crops damaged and wires, trees, signs, and chimneys blown down.....	Do.
Springfield, Mo.	27					Wind	Minor damage done.....	Do.
Jonesboro, Ark.	27				7,000	Tornado	Considerable property damage.....	Do.
Brownsville, Tenn.	27	P. m.				Thunderstorm.....	Several buildings unroofed, plate windows broken, light and telephone poles and trees blown down.....	Do.
Ridgely, Tenn.	28			2		do	Much property damage.....	Do.
Rapid City, S. Dak. (2 to 3 miles west of).....	29	P. m.	1,760 to 3,520.			Hail	Heavy crop damage.....	Do.
Dodge City, Kans.	29				600,000	Wind and hail....	Considerable damage, principally by hail.....	Do.

STORMS AND WEATHER WARNINGS.

By EDWARD H. BOWIE, Supervising Forecaster.

WASHINGTON FORECAST DISTRICT.

From a forecasting standpoint the month was relatively quiet in the Washington Forecast District. No storms of marked severity crossed the district during the month and the advisory information issued for the coastal waters was in connection with the occurrence of squalls attending thunderstorms. No regular storm warnings were issued during the month, although on the evening of the 25th announcement was made for the East Gulf region concerning the presence of a disturbance of slight intensity off the Louisiana coast. This disturbance advanced east-northeastward during the night of the 25th and during the 26th it passed off the South Atlantic coast in the vicinity of Charleston. It was attended by excessive rains over a narrow belt extending from the Louisiana coast eastward to the Atlantic coast and by winds of more than 40 miles an hour in the vicinity of Pensacola, Fla.

On June 8 small-craft warnings were displayed on the Atlantic coast at and north of the Virginia Capes, in expectation of fresh and strong northwest winds during the following afternoon and night of that day; and on the 26th small-craft warnings were again displayed over the same coastal region in expectation of the occurrence of squalls during the afternoon and night of the 26th. The squalls forecast on the 26th occurred quite generally, the severest taking place in the vicinity of New York, where the wind for a short period equalled 60 miles an hour.

Hot waves were the notable feature of the weather during the month, the beginnings and endings of which were successfully forecast. In respect to warm weather, the month was notable, as for example at Washington, D. C., the month gave a greater number of days with maximum temperature 90°, or higher, than ever before recorded at this station in June. It also established for Washington a new June record for consecutive days, 8 in number, with temperature 90°, or higher.

No frost warnings were necessary during the month, although on several days the temperature in the cranberry bogs of New Jersey approached very close to the freezing point.

CHICAGO FORECAST DISTRICT.

No general warnings were necessary in the Chicago Forecast District during the month. There was great variation in temperature, rather cool during the first part, followed by an abnormally warm period, with another period of unseasonably cool weather in the closing days of the month.

Special advices in regard to weather conditions were issued from time to time, and occasionally when the weather map justified, a forecast was made for several days in advance.

The coming of the great heat wave was anticipated in a statement issued on Tuesday, June 12, as follows: "The temperature will rise in the Plains States to-night and in the Middle States Wednesday, and there are now indications of the development of a heat wave in this region before the close of the present week." This was followed on the following day by an additional statement, "The temperature will gradually rise throughout the Middle States, resulting in a warm wave before the end of the week, as indicated in Tuesday's weather bulletin." By the following Monday, June 18, the heat wave had become general over the central portions of the country, the first pronounced heat wave of the season. Shippers of perishable goods were advised of the coming of this heat wave, and, doubtless, important service was rendered by the Bureau at this time.—*H. J. Cox.*

NEW ORLEANS FORECAST DISTRICT.

The weather during June, 1923, did not depart greatly from the conditions that are usual for the month. No storm warnings were issued or required; but threatening conditions in the extreme western portion of the Gulf of Mexico on the 8th justified the display of small-craft warnings issued for the Texas coast on that data.—*R. A. Dyke.*

DENVER FORECAST DISTRICT.

The month was unusually dry and cool in the greater part of the district. The prevalence of high pressure in the Eastern States during the greater part of the month exerted a marked influence on the movement of lows in western districts.